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NOTES ON THE HABITS OF SOME WESTERN  
SNAKES.

BY H. A. BRONS.

WHILE connected with the Geological Survey of the Western States, I had the opportunity to note some peculiar, and as far as I am aware, unreported habits of some of the snakes.

Several of the summers I passed upon the plains were preceded by rainy springs, swelling to unusual height the small streams which became inhabited by small fishes. During the drought of hot summers, the receding waters left the fishes in shallow pools within creek beds, an easy prey to their numerous enemies.

The mid-day heat caused numbers of snakes to seek shelter from the sun, and the garter snake (*Eutænia radix*) in particular, chose water at this time. Here the fishes, unable to escape or find deep cool water, were unwilling co-tenants with the snakes. The latter are fond of fish, and would devour great numbers of the smaller ones, chasing them from one part of the shallow pool to another. When the fishes were in water too shallow to swim in, or were struggling upon the sand, they would be seized by the snakes, who would feed upon them until unable to contain more. The snakes would follow the fish through the water, diving and remaining submerged some time. I did not observe them swallow air (see AM. NAT., Jan., 1880): Snakes evince more than ordinary energy and sagacity in capturing fish; half a dozen will congregate within a small pool, all acting in concert.

Mr. J. L. Wortman, who had charge of a scientific party last year, informs me that while fishing one day he caught numbers of chub (*Cyprinidæ*) and, throwing them on the sand, was surprised to see that but few remained. While quietly continuing to replace those so singularly missing, he observed a garter snake seize and swallow one of the fish six inches in length. There were two of these snakes reaping the reward of Mr. Wortman's skill. Upon opening the snakes one was found to contain six fishes. The head-waters of the Smoky Hill and Big Horn rivers abound in this aquatic *Eutænia radix*.

In Texas, while fishing with a common hook and line, baited with a small scale fish, I had the rare fortune to hook what at first seemed to be an eel, but proved a "cotton mouth" snake (*Ancistrodon piscivorus*).

One morning on examining a line set over night, found the pole as left the previous evening, but the line drawn to shore, and my curiosity was excited as to the catch. It proved to be one of these snakes, coiled upon the bank, the bait, a small scale fish, mashed within its mouth, and the hook well caught. Upon being disturbed it at first showed fight, but took quickly to water, and was landed with the same effort as a fish or eel of equal size, *i. e.*, about twenty-six inches in length. That season I caught three of these venomous snakes in this way while fishing with a hook and line. By Mexicans living on the banks of the San Antonio and San Maguil rivers, I was informed that it is no unusual thing to catch cotton mouths while fishing.

Running short of bait one day, I caught several large toads and tied them together by their hind legs. On nearing the water a snake started to cross the stream; having nothing else to throw at it, I gave the toads a toss in front, hoping to change its course; the snake seized quickly on the struggling mass. Toads exhibit great fear of snakes; it will afford considerable amusement to take a toy or stuffed snake skin and trail it towards one; it will make a strange cry, at the same time making vigorous jumps to escape. Frogs act in the same way, though they are not so readily captured.

Nearly all animals show unmistakable signs of fear when confronted by a snake, though many that do not prey upon them take delight in destroying them, as do the deer family, etc.

Prairie dogs (*Cynomys ludovicianus*) seem to have a most intense dread of rattlesnakes (*Crotalus confluentus*). This little animal dreads not only its venomous bite, but more the loss of its young, which serve as food for these snakes that enter their burrows, take possession and drive them from their homes. Where does one find a prairie dog town but that it is teeming with snakes and the strange little owl (*Speotyto cunicularia*) that "ducks" to passers in ludicrous solemnity? These, though billeted upon the dogs do not constitute a "happy family." The owls, though they generally occupy an abandoned hole or burrow, destroy the young dogs. Nor do the eggs and nestlings of the owls fare with any better treatment from the snakes; between these exists much enmity. One afternoon while passing through one of these dog towns, in Wallace county, Kansas, we heard a most unusual noise and stir (in the town) as though they were

holding a bellicose council. They were collected around a hill,<sup>1</sup> into which they were scraping dirt vigorously. On examining the burrow it was found to contain a large rattlesnake that the dogs were trying to entomb. I noticed this several times, as did other members of our party. To leave no doubt upon the subject we dug out the snakes after shooting them.

The habit of swallowing whole eggs is too well known to merit more than mention. But few persons realize the mischief snakes work in destroying the nests and young of our valuable birds. It is not an unusual occurrence to find whip (*Bascanium flagelliforme*), racers (*Bascanium constrictor*) and bull snakes (*Pityophis sayi*), with the entire contents of quail, prairie hen or domestic fowl's nests within their capacious stomachs. With a little care they may be compelled to disgorge the ingesta unbroken.

During the breeding season the odor of many snakes is quite distinct and perceptible at some distance. This is markedly so in the rattlesnake (*Crotalus confluentis*), its musky and foetid emanations are quickly recognized by frontiersmen.

The manner of union of the sexes at this season is rather instructive. The female among the racers (*Bascanium*) is larger and darker than the males, and not so graceful in form or movements, she, at times, seems to toy with the male, indisposed to yield to his importunities, though pressed with ardor. To avoid his suit, at times, she will dart through grass, among stones, or enter a crevice. Should he be able to reach his mate while within a hole, he is not slow in bringing her to the surface, again to be repulsed. Upon an unbroken ground the sexual communion is less prolonged. Here she is unable to free herself from his quick and effectively directed moves. In case she attempts to quit him, a coil is thrown about her body, and his head laid flat upon her neck, and replaced as promptly as dislodged, evidently in the endeavor to propitiate her.

Of all strange habits in snakes, none equals that observed in the blowing adder (*Heterodon simus*). One afternoon returning to camp, I came upon a box turtle (*Cistudo ornata*) trailing along one of these snakes, which had a firm hold upon the turtle's left hind foot. The turtle was unable to free itself of its tormentor, as its hold was quite secure; so persistently was it maintained that I lifted the turtle by grasping the body of the snake. Con-

<sup>1</sup> The prairie dogs throw up a bank levee about the mouth of their burrows.

siderable force was required to separate them. The snake was about twenty inches long, the turtle eight inches. The foot was bleached, and blood was still flowing; none had apparently escaped from the mouth of the snake. Two toes were missing, having been digested from the foot. The entire foot appeared as though it had been subjected to a continued maceration within the mouth of the snake.

Twice afterward I noticed this strange habit of the puff adders. The late Professor Mudge mentioned to me that he had observed this habit in these snakes. I have not been able to find any signs indicating that the snake ever attaches itself to a fore foot. It seems as though they choose a foot that the turtle is unable to defend. The neck can not reach the hind foot as it can the front, and free it of any object that may attempt to lay hold upon it. The carapace may protect the tail.

I took pains to examine many box turtles (*Cistudo ornata*) that occur along the Smoky Hill rivers, and many, one can safely say one-half, are deformed in their hind feet. Very little deformity is found in the front feet. It must not be taken that all, or even a majority of these deformities are caused by adders. It is not on account of want of food, for there is never a lack of the insects here upon which the snakes generally subsist. It is not thirst, as the habit is practiced where there is water. The appearance of the foot, and the inability of the snake to masticate, would preclude any solution other than the desire to obtain blood as it flows from the lacerated parts.

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## THE LIMIT OF THE INNUIT TRIBES ON THE ALASKA COAST.

BY IVAN PETROFF.

CIRCUMSTANCES over which I had no control detained me for several months during last summer and autumn in the section of Alaska where the Innuvit and Thlinket tribes meet and to a certain extent intermingle with each other. I refer to the Alaskan coast between Prince William sound and Mt. St. Elias.

During a former residence and subsequent continuous travels in Alaska, I have paid particular attention to the distribution of the Innuits. It had always been a question of practical interest